

Techno-economic analysis and process simulation of MixAlco process for mixed alcohol production from seaweed

유준*, Peyman Fasahati¹
부경대학교; ¹부경대학교 화학공학과
(jayliu@pknu.ac.kr*)

Seaweed is a promising source of bioethanol that can be grown more quickly than land-based crops and harvested as fuel without sacrificing usable land. Besides the other advantages of macroalgae like higher productivity, lack of lignin in the chemical structure of macroalgae allows to have milder pretreatment conditions and increased conversion rates for biofuel production. During the last decade, the MixAlco process was studied thoroughly and proved to have high alcohol yield. The process utilizes anaerobic fermentation for volatile fatty acids (VFAs) production and converting them into carboxylate salts. Later, carboxylate salts are dewatered, esterified and hydrogenated into mixed alcohol products. New dewatering process known as multi-effect vapor compression evaporator greatly contribute into plant economy. In this study a 100,000 ton/yr seaweed processing plant were simulated and techno-economic models were developed. Techno-economic models were used to find the advantages and bottlenecks of MixAlco process and optimize it toward better plant economy.